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SEQUENCE LISTING

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<120> USE OF PROTEINS AND PEPTIDES CODED BY THE GENOME OF A NOVEL STRAIN OF SARS-ASSOCIATED CORONAVIRUS

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<150> FR 0314152
<151> 2003-12-02

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<151> 2003-12-02

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<170> PatentIn version 3.1

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<213> CORONAVIRUS

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ctactgtata	ccatataaca	gtgtcacaga	tacaattgtc	gttactgttgc	gtgacggcat	660
ttcaacacca	aaactcaaaag	aagactacca	aattgggtgtt	tattctgagg	ataggcactc	720
agggtttaaa	gactatgtcg	ttgtacatgg	ctatttcacc	gaagtttact	accagcttga	780
gtctcacacaa	attactacag	acactggat	tggaaatgt	acattttca	tctttacaaa	840
gcttgcgtttaaa	gaccaccgaa	atgtcaaat	acacacaatc	gacggcttctt	caggagttgc	900
taatccagca	atggatccaa	tttatgtga	gccgacgacg	actactagcg	tgccttgc	960
agcacaagaa	agtggatcag	aacttatgt	ctcattcggt	tggaaagaaa	caggtacgtt	1020
aatagttaat	agcgacttc	tttttcttgc	tttcgtggta	ttcttgctag	tcacactagc	1080
catccttact	gcgcgtt					1096

<210> 8
<211> 1135
<212> DNA

<213> CORONAVIRUS

<400> 8

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ctcaagggtg	tcaaattaca	ttacacataa	acgaacttat	ggatttgcgtt	atgagatttt	180
ttactcttgg	atcaattact	gcacagccag	taaaaatga	caatgcttct	cctgcaagta	240
ctgttcatgc	tacagcaacg	ataccgctac	aaggcctact	ccctttcgga	tggcttgtta	300
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gatggcagct	agcccctttat	aagggcttcc	agttcatttg	caatttactg	ctgctatttg	420
ttaccatcta	ttcacatctt	ttgcttgcg	ctgcaggat	ggaggcgcaa	tttttgtacc	480
tctatgcctt	gatataatttt	ctacaatgca	tcaacgcatg	tagaattatt	atgagatgtt	540
ggctttgttgc	gaagtgcaaa	tccaagaacc	cattacttta	tgatgccaac	tactttgttt	600
gctggcacac	acataactat	gactactgta	taccatataa	cagtgtcaca	gatacaattg	660
tcgttactga	agtgacggc	atttcaacac	caaaactcaa	agaagactac	caaattggtg	720
gttattctga	ggataggcac	tcaggtgtta	aagactatgt	cgttgtacat	ggctatttca	780
ccgaagtttac	ctaccagctt	gagtctacac	aaattactac	agacactggt	attgaaaatg	840
ctacattctt	catctttaac	aagcttgcgtt	aagacccacc	gaatgtgcaa	atacacacaa	900
tcgacggctc	ttcaggagtt	gctaatccag	caatggatcc	aatttatgtat	gagccgacgaa	960
cgactactag	cgtgcctttg	taagcacaag	aaagtggat	cgaacttatg	tactcattcg	1020
tttcggaaaga	aacaggtacg	ttaatagttt	atagcgtact	tcttttctt	gctttcgtgg	1080
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<210> 9
<211> 1096
<212> DNA
<213> CORONAVIRUS

<220>
<221> CDS
<222> (137)..(958)
<223>

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 acacataaac gaactt atg gat ttg ttt atg aga ttt ttt act ctt gga tca
 Met Asp Leu Phe Met Arg Phe Phe Thr Leu Gly Ser
 1 5 10
 att act gca cag cca gta aaa att gac aat gct tct cct gca agt act 220
 Ile Thr Ala Gln Pro Val Lys Ile Asp Asn Ala Ser Pro Ala Ser Thr
 15 20 25
 gtt cat gct aca gca acg ata ccg cta caa gcc tca ctc cct ttc gga 268
 Val His Ala Thr Ala Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly
 30 35 40
 tgg ctt gtt att ggc gtt gca ttt ctt gct gtt ttt cag agc gct acc 316
 Trp Leu Val Ile Gly Val Ala Phe Leu Ala Val Phe Gln Ser Ala Thr
 45 50 55 60
 aaa ata att gcg ctc aat aaa aga tgg cag cta gcc ctt tat aag ggc 364
 Lys Ile Ile Ala Leu Asn Lys Arg Trp Gln Leu Ala Leu Tyr Lys Gly
 65 70 75
 ttc cag ttc att tgc aat tta ctg ctg cta ttt gtt acc atc tat tca 412
 Phe Gln Phe Ile Cys Asn Leu Leu Leu Phe Val Thr Ile Tyr Ser
 80 85 90
 cat ctt ttg ctt gtc gct gca ggt atg gag gcg caa ttt ttg tac ctc 460
 His Leu Leu Leu Val Ala Ala Gly Met Glu Ala Gln Phe Leu Tyr Leu
 95 100 105
 tat gcc ttg ata tat ttt cta caa tgc atc aac gca tgt aga att att 508
 Tyr Ala Leu Ile Tyr Phe Leu Gln Cys Ile Asn Ala Cys Arg Ile Ile
 110 115 120
 atg aga tgt tgg ctt tgt tgg aag tgc aaa tcc aag aac cca tta ctt 556
 Met Arg Cys Trp Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu
 125 130 135 140
 tat gat gcc aac tac ttt gtt tgc tgg cac aca cat aac tat gac tac 604
 Tyr Asp Ala Asn Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr
 145 150 155
 tgt ata cca tat aac agt gtc aca gat aca att gtc gtt act gaa ggt 652
 Cys Ile Pro Tyr Asn Ser Val Thr Asp Thr Ile Val Val Thr Glu Gly
 160 165 170
 gac ggc att tca aca cca aaa ctc aaa gaa gac tac caa att ggt ggt 700
 Asp Gly Ile Ser Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly
 175 180 185
 tat tct gag gat agg cac tca ggt gtt aaa gac tat gtc gtt gta cat 748
 Tyr Ser Glu Asp Arg His Ser Gly Val Lys Asp Tyr Val Val Val His
 190 195 200
 ggc tat ttc acc gaa gtt tac tac cag ctt gag tct aca caa att act 796
 Gly Tyr Phe Thr Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr
 205 210 215 220
 aca gac act ggt att gaa aat gct aca ttc ttc atc ttt aac aag ctt 844
 Thr Asp Thr Gly Ile Glu Asn Ala Thr Phe Phe Ile Phe Asn Lys Leu
 225 230 235
 gtt aaa gac cca ccg aat gtg caa ata cac aca atc gac ggc tct tca 892
 Val Lys Asp Pro Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser
 240 245 250

gga gtt gct aat cca gca atg gat cca att tat gat gag ccg acg acg	940
Gly Val Ala Asn Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr	
255 260 265	
act act agc gtg cct ttg taagcacaag aaagttagta cgaacttatg	988
Thr Thr Ser Val Pro Leu	
270	
tactcattcg ttccgaga aacaggtacg ttaatagtta atagcgact tcttttctt	1048
gcttcgtgg tattctgct agtcacacta gccatccta ctgcgcctt	1096

<210> 10
<211> 274
<212> PRT
<213> CORONAVIRUS

<400> 10

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Pro Val Lys Ile Asp Asn Ala Ser Pro Ala Ser Thr Val His Ala Thr	
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Ala Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly Trp Leu Val Ile	
35 40 45	
Gly Val Ala Phe Leu Ala Val Phe Gln Ser Ala Thr Lys Ile Ile Ala	
50 55 60	
Leu Asn Lys Arg Trp Gln Leu Ala Leu Tyr Lys Gly Phe Gln Phe Ile	
65 70 75 80	
Cys Asn Leu Leu Leu Phe Val Thr Ile Tyr Ser His Leu Leu Leu	
85 90 95	
Val Ala Ala Gly Met Glu Ala Gln Phe Leu Tyr Leu Tyr Ala Leu Ile	
100 105 110	
Tyr Phe Leu Gln Cys Ile Asn Ala Cys Arg Ile Ile Met Arg Cys Trp	
115 120 125	
Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu Tyr Asp Ala Asn	
130 135 140	
Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr Cys Ile Pro Tyr	
145 150 155 160	
Asn Ser Val Thr Asp Thr Ile Val Val Thr Glu Gly Asp Gly Ile Ser	
165 170 175	
Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly Tyr Ser Glu Asp	
180 185 190	
Arg His Ser Gly Val Lys Asp Tyr Val Val His Gly Tyr Phe Thr	
195 200 205	
Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr Thr Asp Thr Gly	
210 215 220	
Ile Glu Asn Ala Thr Phe Ile Phe Asn Lys Leu Val Lys Asp Pro	
225 230 235 240	
Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser Gly Val Ala Asn	
245 250 255	
Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr Thr Ser Val	
260 265 270	

Pro Leu

<210> 11
<211> 1096
<212> DNA
<213> CORONAVIRUS

<220>
<221> CDS
<222> (558)..(1019)
<223>
<400> 11

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acacataaaac gaacttatgg atttgcatttgc a	gagattttt actcttggat caattactgc	180
acagccagta aaaattgaca atgcattctcc tgcaagttact	gatccatgcta cagcaacgat	240
accgctacaa gcctcaactcc ctttgcgtat	gcttgcattt ggcgttgcatt ttcttgcgtt	300
ttttcagatc gctaccaaaa taattgcgtt caataaaaaga	tggcagcttag ccctttataaa	360
gggcttccag ttcatggca atttactgtt gctattttt accatcttatt cacatcttt	cacatctttt	420
gcttgcgtt gcaggatgtt aggccaaatt ttttgcgtt ttttgcgtt ttttgcgtt	tatatttttt	480
acaatgcattt aacgcattttaa gaattattt gatgttgg ctttgcgtt agtgcataatc	ttttgcgtt aacgcattttaa	540
caagaaccca ttactttt atg atg cca act act ttg ttt gct ggc aca cac	ttttgcgtt aacgcattttaa	590
Met Met Pro Thr Thr Leu Phe Ala Gly Thr His		
1 5 10		
ata act atg act act gta tac cat ata aca gtg tca cag ata caa ttg		638
Ile Thr Met Thr Thr Val Tyr His Ile Thr Val Ser Gln Ile Gln Leu		
15 20 25		
tcg tta ctg aag gtg acg gca ttt caa cac caa aac tca aag aag act		686
Ser Leu Leu Lys Val Thr Ala Phe Gln His Gln Asn Ser Lys Lys Thr		
30 35 40		
acc aaa ttg gtg gtt att ctg agg ata ggc act cag gtg tta aag act		734
Thr Lys Leu Val Val Ile Leu Arg Ile Gly Thr Gln Val Leu Lys Thr		
45 50 55		
atg tcg ttg tac atg gct att tca ccg aag ttt act acc agc ttg agt		782
Met Ser Leu Tyr Met Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser		
60 65 70 75		
cta cac aaa tta cta cag aca ctg gta ttg aaa atg cta cat tct tca		830
Leu His Lys Leu Gln Thr Leu Val Leu Lys Met Leu His Ser Ser		
80 85 90		
tct tta aca agc ttg tta aag acc cac cga atg tgc aaa tac aca caa		878
Ser Leu Thr Ser Leu Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln		
95 100 105		
tcg acg gct ctt cag gag ttg cta atc cag caa tgg atc caa ttt atg		926
Ser Thr Ala Leu Gln Glu Leu Leu Ile Gln Gln Trp Ile Gln Phe Met		
110 115 120		
atg agc cga cga cga cta cta gcg tgc ctt tgt aag cac aag aaa gtg		974
Met Ser Arg Arg Arg Leu Leu Ala Cys Leu Cys Lys His Lys Lys Val		
125 130 135		
agt acg aac tta tgt act cat tcg ttt cgg aag aaa cag gta cgt		1019
Ser Thr Asn Leu Cys Thr His Ser Phe Arg Lys Lys Gln Val Arg		
140 145 150		
taatagttaa tagcgtactt cttttcttg ctttcgttatttcttgcata gtcacactag		1079
ccatccttac tgcgctt		1096

<210> 12
<211> 154
<212> PRT
<213> CORONAVIRUS

<400> 12

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Val Tyr His Ile Thr Val Ser Gln Ile Gln Leu Ser Leu Leu Lys Val		
20 25 30		
Thr Ala Phe Gln His Gln Asn Ser Lys Lys Thr Thr Lys Leu Val Val		
35 40 45		
Ile Leu Arg Ile Gly Thr Gln Val Leu Lys Thr Met Ser Leu Tyr Met		
50 55 60		
Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser Leu His Lys Leu Leu		
65 70 75 80		
Gln Thr Leu Val Leu Lys Met Leu His Ser Ser Ser Leu Thr Ser Leu		
85 90 95		
Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln Ser Thr Ala Leu Gln		
100 105 110		

<210> 13
<211> 332
<212> DNA
<213> CORONAVIRUS

<220>
<221> CDS
<222> (36)..(263)
<223>

<400> 13

<210> 14
<211> 76
<212> PRT
<213> CORONAVIRUS

<400> 14

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Val	Leu	Leu	Phe	Leu	Ala	Phe	Val	Val	Phe	Leu	Leu	Val	Thr	Leu	Ala
									20						30
Ile	Leu	Thr	Ala	Leu	Arg	Leu	Cys	Ala	Tyr	Cys	Cys	Asn	Ile	Val	Asn
									35						45
Val	Ser	Leu	Val	Lys	Pro	Thr	Val	Tyr	Val	Tyr	Ser	Arg	Val	Lys	Asn
									50						60
Leu	Asn	Ser	Ser	Glu	Gly	Val	Pro	Asp	Leu	Leu	Val				
									65						75

<210> 15
<211> 332
<212> DNA
<213> CORONAVIRUS

<400> 15

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tcacactagc	catccttact	gcgcttcgtat	tgtgtgcgtat	ctgctgcaat	180
tgagtttagt	aaaaccaacg	gttacgtct	actcgcgtgt	taaaaaatctg	240
aaggagttcc	tgtatcttctg	gtctaaacga	actaactatt	attattattc	300
tttaacattt	cttacatgg	cagacaacgg	ta		332
<210> 16					
<211> 708					
<212> DNA					
<213> CORONAVIRUS					
<220>					
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<222> (41)..(703)					
<223>					
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				Met Ala Asp Asn Gly	
				1 5	
act att acc gtt gag gag	ctt aaa caa ctc	ctg gaa caa	tgg aac cta		103
Thr Ile Thr Val Glu Glu	Leu Lys Gln Leu	Leu Glu Gln	Trp Asn Leu		
10	15	20			
gta ata ggt ttc cta ttc	cta gcc tgg att atg	tta cta caa	ttt gcc		151
Val Ile Gly Phe Leu Phe	Leu Ala Trp Ile	Met Leu Leu	Gln Phe Ala		
25	30	35			
tat tct aat cgg aac agg	ttt ttg tac ata	ata aag ctt	gtt ttc ctc		199
Tyr Ser Asn Arg Asn Arg	Phe Leu Tyr Ile	Ile Lys Leu	Val Phe Leu		
40	45	50			
tgg ctc ttg tgg cca gta	aca ctt gct ttt	gtg ctt gct gct	gtc		247
Trp Leu Leu Trp Pro Val	Thr Leu Ala Cys	Phe Val Leu Ala	Ala Val		
55	60	65			
tac aga att aat tgg	gtg act ggc ggg	att gca atg	gct tgt		295
Tyr Arg Ile Asn Trp Val	Thr Gly Gly Ile	Ala Ile Ala	Met Ala Cys		
70	75	80	85		
att gta ggc ttg atg tgg	ctt agc tac ttc	gtt gct tcc	ttc agg ctg		343
Ile Val Gly Leu Met Trp	Leu Ser Tyr Phe Val	Ala Ser Phe	Arg Leu		
90	95	100			
ttt gct cgt acc cgc tca	atg tgg tca ttc	aac cca gaa	aca aac att		391
Phe Ala Arg Thr Arg Ser	Met Trp Ser Phe	Asn Pro Glu	Thr Asn Ile		
105	110	115			
ctt ctc aat gtg cct ctc	cgg ggg aca att	gtg acc aga	ccg ctc atg		439
Leu Leu Asn Val Pro Leu	Arg Gly Thr Ile	Val Thr Arg	Pro Leu Met		
120	125	130			
gaa agt gaa ctt gtc	att ggt gct gtg	atc att cgt	ggt cac ttg cga		487
Glu Ser Glu Leu Val Ile	Gly Ala Val Ile	Ile Arg Gly	His Leu Arg		
135	140	145			
atg gcc gga cac tcc	cta ggg cgc tgg	gac att aag	gac ctg cca	aaa	535
Met Ala Gly His Ser	Leu Gly Arg Cys	Asp Ile	Lys Asp Leu Pro	Lys	
150	155	160	165		
gag atc act gtg gct	aca tca cga acg	ctt tct tat	tac aaa tta	gga	583
Glu Ile Thr Val Ala	Thr Ser Arg Thr	Leu Ser Tyr	Tyr Lys Leu	Gly	
170	175	180			
gcg tcg cag cgt gta	ggc act gat tca	ggt ttt	gct gca tac	aac cgc	631
Ala Ser Gln Arg Val	Gly Thr Asp Ser	Gly Phe Ala	Ala Tyr	Asn Arg	
185	190	195			
tac cgt att gga aac	tat aaa tta aat	aca gac cac	gcc ggt	agc aac	679
Tyr Arg Ile Gly Asn	Tyr Lys Leu Asn	Thr Asp His	Ala Gly	Ser Asn	
200	205	210			
gac aat att gct ttg	cta gta cag	taagt			708
Asp Asn Ile Ala	Leu Val Gln				
215	220				

<210> 17
 <211> 221
 <212> PRT
 <213> CORONAVIRUS

<400> 17

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						20			25						30
Leu	Leu	Gln	Phe	Ala	Tyr	Ser	Asn	Arg	Asn	Arg	Phe	Leu	Tyr	Ile	Ile
						35			40						45
Lys	Leu	Val	Phe	Leu	Trp	Leu	Leu	Trp	Pro	Val	Thr	Leu	Ala	Cys	Phe
						50			55						60
Val	Leu	Ala	Ala	Val	Tyr	Arg	Ile	Asn	Trp	Val	Thr	Gly	Gly	Ile	Ala
						65			70			75			80
Ile	Ala	Met	Ala	Cys	Ile	Val	Gly	Leu	Met	Trp	Leu	Ser	Tyr	Phe	Val
						85			90						95
Ala	Ser	Phe	Arg	Leu	Phe	Ala	Arg	Thr	Arg	Ser	Met	Trp	Ser	Phe	Asn
						100			105						110
Pro	Glu	Thr	Asn	Ile	Leu	Leu	Asn	Val	Pro	Leu	Arg	Gly	Thr	Ile	Val
						115			120			125			
Thr	Arg	Pro	Leu	Met	Glu	Ser	Glu	Leu	Val	Ile	Gly	Ala	Val	Ile	Ile
						130			135			140			
Arg	Gly	His	Leu	Arg	Met	Ala	Gly	His	Ser	Leu	Gly	Arg	Cys	Asp	Ile
						145			150			155			160
Lys	Asp	Leu	Pro	Lys	Glu	Ile	Thr	Val	Ala	Thr	Ser	Arg	Thr	Leu	Ser
						165			170			175			
Tyr	Tyr	Lys	Leu	Gly	Ala	Ser	Gln	Arg	Val	Gly	Thr	Asp	Ser	Gly	Phe
						180			185			190			
Ala	Ala	Tyr	Asn	Arg	Tyr	Arg	Ile	Gly	Asn	Tyr	Lys	Leu	Asn	Thr	Asp
						195			200			205			
His	Ala	Gly	Ser	Asn	Asp	Asn	Ile	Ala	Leu	Leu	Val	Gln			
						210			215			220			

<210> 18
 <211> 769
 <212> DNA
 <213> CORONAVIRUS

<400> 18

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aatggAACCT	agtaataggt	ttcctattcc	tagcctggat	tatgttacta	caatttgcct	180
attctaatcg	gaacagggtt	ttgtacataa	taaagcttgc	tttcctctgg	ctcttggc	240
cagtaacact	tgcttggttt	gtgcttgctg	ctgtctacag	aattaattgg	gtgactggcg	300
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ttctcaatgt	gcctcccg	gggacaattt	tgaccagacc	gctcatggaa	agtgaacttg	480
tcattgggtgc	tgtgtcatt	cgtggctact	tgcgatggc	cggacactcc	ctagggcgct	540
gtgacattaa	ggacctgcca	aaagagatca	ctgtggctac	atcacgaacg	cttcttatt	600
acaaaatttgg	agcgtcgag	cgtgttaggca	ctgattcagg	ttttgcgtca	tacaaccgct	660
accgtattgg	aaactataaa	ttaaatacag	accacgcccgg	tagcaacgac	aatatttgctt	720
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<210> 19
 <211> 1231
 <212> DNA
 <213> CORONAVIRUS

<400> 19

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agagatattt	attatcatta	tgaggactt	caggattgc	atttggaaatc	ttgacgttat	180
aataagttca	atagtggagac	aattattttaa	gcctctaact	aagaagaatt	attcggagtt	240
agatgatgaa	gaacccatgg	agtttagatta	tccataaaac	gaacatgaaa	attattctct	300
tcctgacatt	gattgttattt	acatcttgcg	agctatatca	ctatcaggag	tgtgttagag	360
gtacgactgt	actactaaaa	gaacccgtcc	catcaggaac	atacgagggc	aattcaccat	420
ttcacccctct	tgctgacaat	aaatttgcac	taacttgcac	tagcacacac	tttgcttttg	480
cttgcgtga	cggtaactcga	catacctatc	agctgcgtgc	aagatcagtt	tcacccaaac	540
ttttcatcg	acaagaggag	gttcaacaag	agctctactc	gccactttt	ctcattgttg	600
ctgctctagt	attttaata	cttgcgttca	ccattaaagag	aaagacagaa	tgaatgagct	660
cacttaatt	gacttctatt	tgtgttttt	agccttctg	ctattccttg	tttaataat	720
gcttattata	ttttgtttt	cactcgaaat	ccaggatcta	gaagaacctt	gtacccaaagt	780
ctaaacgaac	atgaaacttc	tcattgttt	gacttgtatt	tctctatgca	gttgcatatg	840
cactgttagta	cagcgtgtg	catctaataa	acccatgtg	cttgaagatc	cttgcgttgc	900
acaacactag	gggttaatact	tatagcactg	cttggcttt	tgctctagga	aaggttttac	960
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<210> 20

<211> 1242

<212> DNA

<213> CORONAVIRUS

<400> 20

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ggttacaata	gcagagatat	tgattatcat	tatgaggact	ttcaggatttgc	ctatttggaa	180
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<212> DNA

<213> CORONAVIRUS

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<212> PRT
<213> CORONAVIRUS

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20          25          30
Ile Ser Ser Ile Val Arg Gln Leu Phe Lys Pro Leu Thr Lys Lys Asn
35          40          45
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50          55          60

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<221> CDS
<222> (285)..(650)
<223>

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agagatattg attatcatta tgaggacttt caggattgct atttggaaatc ttgacgttat 180
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<211> 122
<212> PRT
<213> CORONAVIRUS

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Leu Tyr His Tyr Gln Glu Cys Val Arg Gly Thr Thr Val Leu Leu Lys
20          25          30
Glu Pro Cys Pro Ser Gly Thr Tyr Glu Gly Asn Ser Pro Phe His Pro
35          40          45
Leu Ala Asp Asn Lys Phe Ala Leu Thr Cys Thr Ser Thr His Phe Ala
50          55          60
Phe Ala Cys Ala Asp Gly Thr Arg His Thr Tyr Gln Leu Arg Ala Arg
65          70          75          80
Ser Val Ser Pro Lys Leu Phe Ile Arg Gln Glu Glu Val Gln Gln Glu
85          90          95
Leu Tyr Ser Pro Leu Phe Leu Ile Val Ala Ala Leu Val Phe Leu Ile
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Leu Cys Phe Thr Ile Lys Arg Lys Thr Glu
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 <221> CDS
 <222> (650)..(781)
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ctgctctagt	attttaata	ctttgcttca	ccattaagag	aaagacaga	atg aat gag	658
				Met	Asn Glu	
				1		
ctc act tta att	gac ttc tat	ttg tgc ttt	tta gcc ttt	ctg cta ttc		706
Leu Thr Leu Ile	Asp Phe Tyr	Leu Cys Phe	Leu Ala Phe	Leu Leu Phe		
5	10	15				
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Leu Val Leu Ile	Met Leu Ile	Ile Phe Trp	Phe Ser Leu	Glu Ile Gln		
20	25	30	35			
gat cta gaa gaa	cct tgt acc	aaa gtc	taaacgaaca	tgaaacttct		801
Asp Leu Glu Glu	Pro Cys Thr	Lys Val				
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 <211> 44
 <212> PRT
 <213> CORONAVIRUS

<400> 26

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35	40					

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 <212> DNA
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<222> (791)..(907)

<223>

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	Met	Lys	Leu	Leu	Ile	Val	Leu	Thr	Cys	Ile	Ser	Leu	Cys			
1	5															
agt	tgc	ata	tgc	act	gta	gta	cag	cgc	tgt	gca	tct	aat	aaa	cct	cat	877
Ser	Cys	Ile	Cys	Thr	Val	Val	Gln	Arg	Cys	Ala	Ser	Asn	Lys	Pro	His	
15	20															25
gtg	ctt	gaa	gat	cct	tgt	aag	gta	caa	cac	tagggtaat	acttata	actagca				927
Val	Leu	Glu	Asp	Pro	Cys	Lys	Val	Gln	His							
30	35															
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<211> 39

<212> PRT

<213> CORONAVIRUS

<400> 28

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20	25															30
Asp	Pro	Cys	Lys	Val	Gln	His										
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<210> 29

<211> 1231

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<223>

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 Val Arg Tyr Asn Thr Arg Gly Asn Thr Tyr Ser Thr Ala Trp Leu Cys
 10 15 20

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Ala Leu Gly Lys Val Leu Pro Phe His Arg Trp His Thr Met Val Gln

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40 45 50
gca ctt ata gct agg tgt tgg tac ctt cat gaa ggt cac caa act gct 1085
Ala Leu Ile Ala Arg Cys Trp Tyr Leu His Glu Gly His Gln Thr Ala

55 60 65 70
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Ala Phe Arg Asp Val Leu Val Val Leu Asn Lys Arg Thr Asn

75 80
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<213> CORONAVIRUS

<400> 30

<210> 31
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<211> 297

<212> DNA

<213> CORONAVIRUS

<400> 32

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<210> 33

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<213> CORONAVIRUS

<400> 33

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35 40 45

Leu Gly Ser Gln Leu Ser Leu Ser Met Ala Arg Arg Asn Leu Asp Ser
 50 55 60
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 50 55 60
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 Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro
 1 5 10
 cgc att aca ttt ggt gga ccc aca gat tca act gac aat aac cag aat 156
 Arg Ile Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn
 15 20 25 30
 gga gga cgc aat ggg gca agg cca aaa cag cgc cga ccc caa ggt tta 204
 Gly Gly Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu
 35 40 45
 ccc aat aat act gcg tct tgg ttc aca gct ctc act cag cat ggc aag 252
 Pro Asn Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys
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Ser Gly Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg	
80 85 90	
gtt cgt ggt ggt gac ggc aaa atg aaa gag ctc agc ccc aga tgg tac	396
Val Arg Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr	
95 100 105 110	
tcc tat tac cta gga act ggc cca gaa gct tca ctt ccc tac ggc gct	444
Phe Tyr Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala	
115 120 125	
aac aaa gaa ggc atc gta tgg gtt gca act gag gga gcc ttg aat aca	492
Asn Lys Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr	
130 135 140	
ccc aaa gac cac att ggc acc cgc aat cct aat aac aat gct gcc acc	540
Pro Lys Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr	
145 150 155	
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Val Leu Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala	
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Glu Gly Ser Arg Gly Ser Gln Ala Ser Ser Arg Ser Ser Arg	
175 180 185 190	
agt cgc ggt aat tca aga aat tca act cct ggc agc agt agg gga aat	684
Ser Arg Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn	
195 200 205	
tct cct gct cga atg gct agc gga ggt ggt gaa act gcc ctc gcg cta	732
Ser Pro Ala Arg Met Ala Ser Gly Gly Glu Thr Ala Leu Ala Leu	
210 215 220	
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Leu Leu Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys	
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Gly Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu	
240 245 250	
gca tct aaa aag cct cgc caa aaa cgt act gcc aca aaa cag tac aac	876
Ala Ser Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn	
255 260 265 270	
gtc act caa gca ttt ggg aga cgt ggt cca gaa caa acc caa gga aat	924
Val Thr Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn	
275 280 285	
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Phe Gly Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp	
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Pro Gln Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met	
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tca cgc att ggc atg gaa gtc aca cct tcg gga aca tgg ctg act tat	1068
Ser Arg Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr	
320 325 330	
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His Gly Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn	
335 340 345 350	
gtc ata ctg ctg aac aag cac att gac gca tac aaa aca ttc cca cca	1164
Val Ile Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro	
355 360 365	
aca gag cct aaa aag gac aaa aag aaa aag act gat gaa gct cag cct	1212
Thr Glu Pro Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro	
370 375 380	

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Leu Pro Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala	
385 390 395	
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Ala Asp Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly	
400 405 410	
gct tct gct gat tca act cag gca taa acactcatga tgaccacaca	1355
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 <212> PRT
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35 40 45	
Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu	
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Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg	
85 90 95	
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115 120 125	
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Asp His Ile Gly Thr Arg Asn Pro Asn Asn Ala Ala Thr Val Leu	
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195 200 205	
Ala Arg Met Ala Ser Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu	
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245 250 255	
Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr	
260 265 270	
Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly	
275 280 285	
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305 310 315 320	
Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly	
325 330 335	
Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile	
340 345 350	

Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu
 355 360 365
 Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro
 370 375 380
 Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp
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 Ala Asp Ser Thr Gln Ala
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<210> 38

<211> 1377

<212> DNA

<213> CORONAVIRUS

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<211> 204

<212> DNA

<213> CORONAVIRUS

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<211> 809

<212> DNA

<213> CORONAVIRUS

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<211> 448
<212> DNA
<213> CORONAVIRUS

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<210> 42
<211> 2033
<212> DNA
<213> CORON

<400> 42
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<210> 43

<211> 2018

<212> DNA

<213> CORONAVIRUS

<400> 43

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<210> 44

<211> 1442

<212> DNA

<213> CORONAVIRUS

<400> 44

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gttatacact	tgaggaagct	aagactgc	ttaagaaatg	caaactgc	ttttatgtac	360
tacccatcaga	agcaccaat	gctaaggaag	agattctagg	aactgtatcc	tgaaatttga	420
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atttgcctag	tgttttatta	gcacttcaac	agcttgaagt	caaattcaat	gcaccagcac	1380
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<210> 45

<211> 1050

<212> DNA

<213> CORONAVIRUS

<400> 45

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cttactatac	agagcagcct	atagacctt	taccaactca	accattacca	aatgcgagtt	1020
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<210> 46

<211> 1995

<212> DNA

<213> CORONAVIRUS

<400> 46

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<210> 47

<211> 1884

<212> DNA

<213> CORONAVIRUS

<400> 47

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<210> 48

<211> 2020

<212> DNA

<213> CORONAVIRUS

<400> 48

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gtcaagaaa	attgttaagg	gcactcatca	ttggatgctt	ttaacttct	tgacatcact	1920
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<210> 49

<211> 2040

<212> DNA

<213> CORONAVIRUS

<400> 49

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tcccttcgaa	ttgttatagtt	aggcaagtgc	attgtcatca	gtacaagctg	tttgc当地	300
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accaagagta	aatggcaaga	aagcattctc	gtaaacaaag	aaaaacagt	accactgtgt	1980
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<210> 50

<211> 2012

<212> DNA

<213> CORONAVIRUS

<400> 50

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<210> 51

<211> 1877

<212> DNA

<213> CORONAVIRUS

<400> 51

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<210> 52

<211> 2051

<212> DNA

<213> CORONAVIRUS

<400> 52

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agatgcaatt	ctctgtcaga	gagtaacttcg	cgtacagtgg	caataccata	tgacagctta	1980
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<210> 53

<211> 2075

<212> DNA

<213> CORONAVIRUS

<400> 53

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<210> 54

<211> 1891

<212> DNA

<213> CORONAVIRUS

<400> 54

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Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn
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Thr	Phe	Cys	Thr	Gly	Ser	Thr	Phe	Ile	Ser	Asp	Glu	Val	Ala	Arg
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His	Leu	Tyr	Phe	Asp	Lys	Ala	Gly	Gln	Lys	Thr	Tyr	Glu	Arg	His
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Glu Lys Asp Glu Glu Gly Asn Leu Leu Asp Ser Tyr Phe Val Val Lys
50 55 60
Arg His Thr Met Ser Asn Tyr Gln His Glu Glu Thr Ile Tyr Asn Leu
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Val Lys Asp Cys Pro Ala Val Ala Val His Asp Phe Phe Lys Phe Arg
85 90 95
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Tyr Thr Met Ala Asp Leu Val Tyr Ala Leu Arg His Phe Asp Glu Gly
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Glu Val Val Asp Lys Tyr Phe Asp Cys Tyr Asp Gly Gly Cys Ile Asn			
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Ala Asn Gln Val Ile Val Asn Asn Leu Asp Lys Ser Ala Gly Phe Pro			
485	490	495	
Phe Asn Lys Trp Gly Lys Ala Arg Leu Tyr Tyr Asp Ser Met Ser Tyr			
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Glu Asp Gln Asp Ala Leu Phe Ala Tyr Thr Lys Arg Asn Val Ile Pro			
515	520	525	
Thr Ile Thr Gln Met Asn Leu Lys Tyr Ala Ile Ser Ala Lys Asn Arg			
530	535	540	
Ala Arg Thr Val Ala Gly Val Ser Ile Cys Ser Thr Met Thr Asn Arg			
545	550	555	560
Gln Phe His Gln Lys Leu Leu Lys Ser Ile Ala Ala Thr Arg Gly Ala			
565	570	575	
Thr Val Val Ile Gly Thr Ser Lys Phe Tyr Gly Gly Trp His Asn Met			
580	585	590	
Leu Lys Thr Val Tyr Ser Asp Val Glu Thr Pro His Leu Met Gly Trp			
595	600	605	
Asp Tyr Pro Lys Cys Asp Arg Ala Met Pro Asn Met Leu Arg Ile Met			
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Ala Ser Leu Val Leu Ala Arg Lys His Asn Thr Cys Cys Asn Leu Ser			
625	630	635	640
His Arg Phe Tyr Arg Leu Ala Asn Glu Cys Ala Gln Val Leu Ser Glu			
645	650	655	
Met Val Met Cys Gly Gly Ser Leu Tyr Val Lys Pro Gly Gly Thr Ser			
660	665	670	
Ser Gly Asp Ala Thr Thr Ala Tyr Ala Asn Ser Val Phe Asn Ile Cys			
675	680	685	
Gln Ala Val Thr Ala Asn Val Asn Ala Leu Leu Ser Thr Asp Gly Asn			
690	695	700	
Lys Ile Ala Asp Lys Tyr Val Arg Asn Leu Gln His Arg Leu Tyr Glu			
705	710	715	720
Cys Leu Tyr Arg Asn Arg Asp Val Asp His Glu Phe Val Asp Glu Phe			
725	730	735	
Tyr Ala Tyr Leu Arg Lys His Phe Ser Met Met Ile Leu Ser Asp Asp			
740	745	750	
Ala Val Val Cys Tyr Asn Ser Asn Tyr Ala Ala Gln Gly Leu Val Ala			
755	760	765	
Ser Ile Lys Asn Phe Lys Ala Val Leu Tyr Tyr Gln Asn Asn Val Phe			
770	775	780	
Met Ser Glu Ala Lys Cys Trp Thr Glu Thr Asp Leu Thr Lys Gly Pro			
785	790	795	800
His Glu Phe Cys Ser Gln His Thr Met Leu Val Lys Gln Gly Asp Asp			
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Tyr Val Tyr Leu Pro Tyr Pro Asp Pro Ser Arg Ile Leu Gly Ala Gly			
820	825	830	
Cys Phe Val Asp Asp Ile Val Lys Thr Asp Gly Thr Leu Met Ile Glu			
835	840	845	
Arg Phe Val Ser Leu Ala Ile Asp Ala Tyr Pro Leu Thr Lys His Pro			
850	855	860	
Asn Gln Glu Tyr Ala Asp Val Phe His Leu Tyr Leu Gln Tyr Ile Arg			
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Lys Leu His Asp Glu Leu Thr Gly His Met Leu Asp Met Tyr Ser Val			
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Met Leu Thr Asn Asp Asn Thr Ser Arg Tyr Trp Glu Pro Glu Phe Tyr
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 Glu Ala Met Tyr Thr Pro His Thr Val Leu Gln Ala Val Gly Ala Cys
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 Arg Pro Phe Leu Cys Cys Lys Cys Cys Tyr Asp His Val Ile Ser Thr
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 Ser His Lys Leu Val Leu Ser Val Asn Pro Tyr Val Cys Asn Ala Pro
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 Gly Cys Asp Val Thr Asp Val Thr Gln Leu Tyr Leu Gly Gly Met Ser
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 Tyr Tyr Cys Lys Ser His Lys Pro Pro Ile Ser Phe Pro Leu Cys Ala
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 Asn Gly Gln Val Phe Gly Leu Tyr Lys Asn Thr Cys Val Gly Ser
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 Ser Lys Val Gln Ile Gly Glu Tyr Thr Phe Glu Lys Gly Asp Tyr
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 1340 1345 1350
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Thr	His	Leu	Ser	Val	Asp	Ile	Lys	Phe	Lys	Thr	Glu	Gly	Leu	Cys
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Leu	Ala	Val	His	Glu	Cys	Phe	Val	Lys	Arg	Val	Asp	Trp	Ser	Val
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Cys	Val	Pro	Gln	Ala	Glu	Val	Glu	Trp	Lys	Phe	Tyr	Asp	Ala	Gln
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<212> DNA

<213> Artificial sequence

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<223> PCR primer

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34

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<400> 152

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33

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<212> DNA

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59

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<210> 158
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<400> 158
ataggatccg cgcgcattt atttatcgtc gtcattttta taatc 45